. V, No. 5

Technology
MAY, 1944
keep
MAY 25 1944

OPERTY OF THE
LE PUBLIC LIBRARY

BORDEN'S REVIEW

of

NUTRITION RESEARCH

THE PREVALENCE OF MALNUTRITION

As Indicated By Dietary Surveys

BORDEN'S REVIEW
of
NUTRITION RESEARCH

Reviews and summaries of research information concerning nutrition and foods. Published monthly, except during July and August, by THE BORDEN COMPANY, 350 Madison Avenue, New York 17, N. Y. Edited by Ruth Woods.

PROPERTY OF THE
SEATTLE PUBLIC LIBRARY

THE PREVALENCE OF MALNUTRITION*

As Indicated By Dietary Surveys

The widespread prevalence of substandard diets in the United States has been reported frequently, and its implications generally appreciated. Many surveys in the past ten years have indicated this condition, and corrective measures have been instituted with increasing urgency. However, since these surveys were published at irregular intervals, and in widely scattered journals, their full significance in the aggregate has scarcely been considered. Also, due to the lack of uniformity in the selection of dietary standards and presentation of data, most of the findings were not comparable. Recently, however, this situation was remedied. To provide proper perspective, and for convenient reference, the Committee on Diagnosis and Pathology of Nutritional Deficiencies of the National Research Council brought together the impressive volume of material resulting from the dietary surveys and, for the first time, presented the results on a uniform and comparable basis (1).

To delineate the occurrence of malnutrition, the Committee assembled three types of evidence which had been secured through (a) medical assessments of the nutritional status in samples of the population, (b) official death rates and hospital admission figures and (c) records of food consumption or dietary surveys. Although these three classes of data, even with full development of the methods used in their acquisition, cannot be expected to yield identical information, they do show trends which are reasonably parallel. This Review will summarize the evidence secured through dietary surveys.

Evaluating Diets:

In the development of evidence on malnutrition through dietary surveys, the average nutrient values of specific foods are assumed in estimating the nutritional content of dietaries of various population groups. These calculated values are compared against recommended daily allowances of food essentials which are used as standards and considered necessary for satisfactory or optimal nutrition (Table 1). The Council presented two sample dietary patterns (12) to show the varied ways in which its recommended dietary allowances of food essentials may be met. One of the dietary patterns includes milk, 1 pint;

---

*In the temporary absence of the Editor, this issue was prepared by Raymond Hertwig of The Borden Company's scientific staff.

egg, 1 daily (on days not used, beans, peanuts, cheese or more mil or meat instead); meat, fish or fowl, 1 or more servings; potato, 1 o more; vegetables, 2 or more servings, one green or yellow; fruits, 2 o more, one citrus fruit or tomato or other good source of vitamin C cereals or bread, whole-grain or enriched. Other foods as needed ar added to complete the meal. The nutritional rating given the surve dietaries is assumed by this procedure to reflect the nutritional statu of the groups investigated. This method of determining the preva lence of malnutrition has obvious imperfections and limitations which will be discussed later.

TABLE 1—RECENT STANDARDS AND SYSTEMS WHICH HAVE BEEN USED IN EVALUATING DIETS

	Daily allowances for a moderately active 70-kilogram man					
	Stiebeling and Phipard * 1939		Stiebeling, et al. † 1941		Food and Nutrition Board, National Research Council	Food and Drug Administration Minimum
Nutrient	A	B	C	D		
Protein, Gm.	67	45	75	50	70	...
Calcium, Gm.	0.68	0.45	0.68	0.45	0.8	...
Phosphorus, Gm.	1.32	0.88	1.32	0.88	...	...
Iron, Mg.	15	10	15	10	12	...
Vitamin A, I.U.	6,000	3,000	6,000	3,000	5,000	4,000
Thiamin, Mg.	1.5	0.75	2.0	1.0	1.8	1.0
Riboflavin, Mg.	1.8	0.9	1.8	0.9	2.7	2.0
Ascorbic Acid, Mg.	75	37	60	30	75	30

* Diets were graded as follows:
Good—If the uncooked food furnished each nutrient in at least the quantity specified under Column A Such a diet was characterized as "providing a wide margin of safety over and above average minimu requirements."
Fair—"Diets better in every respect than the specifications for poor diets, but poorer in one or mo nutrients than the specifications for good diets." Such a diet was regarded as providing average minimu requirements with a limited margin of safety.
Poor—If the raw food provided less of any one nutrient than the quantity listed under Column B Such a diet was said to be in need of improvement with respect to one or more nutrients.

† Diets were graded as follows:
Excellent—Diet provides each nutrient in at least the quantity specified under Column C.
Good—Diet provides at least a 50 percent margin beyond the specifications listed for each nutrient unde Column D, but less than 100 percent margin in the case of the vitamins.
Fair—Diet meets or exceeds the quantity specified for each nutrient under Column D, but by less than a 50 percent margin with respect to one or more nutrients.
Poor—Diet failed to meet specifications under Column D with respect to one or more nutrients.

Generally, the surveys reviewed substantiate the conclusion of Jolliffe, McLester and Sherman in 1942 (2): "The evidence at our disposal warrants the conclusion that dietary inadequacies and malnutrition of varying degrees are of frequent occurrence in the United States and that the nutritional status of an appreciable part of the population can be distinctly improved. If optimum nutrition is sought, not mere adequacy, then widespread improvement is possible."

Surveys Conducted From 1933-1937:

Striking examples in support of this conclusion were disclosed by the surveys reviewed. In canvasses of low-income families in six large

cities in 1933, it was found that the average daily caloric intake of a considerable percentage of the families surveyed was below the estimated minimum requirement and many families were 20 percent under that level (3, 4, 5). Two-thirds of all the families of five of the cities consumed diets at or below minimum standard levels for several protective foods.

The diets of families of employed wage-earners and clerical workers in 43 industrial centers in eight major geographical regions were studied in 1935-36 (6). The maximum proportion of white families with good diets in any region was only 21 percent. Only 11 percent of the colored families had good diets. The percentage of families with unsatisfactory diets was extremely high.

Investigations (7) in 66 counties in five broad geographic regions during 1936-37 showed that a substantial proportion of farm operators' families were subsisting on a frankly unsatisfactory plane. More than one-third of the diets in the North and West were extremely low in calcium and vitamin A; one-fifth were below standard in ascorbic acid. In the Southeast one-half of the poorest diets were extremely low in vitamins A and C. About one-half of the Negro farm families had extremely poor diets with marked shortages of vitamins A and C, thiamin, riboflavin, calcium and protein. Contrary to what might be expected, an extraordinarily high proportion of farm families may be improperly fed.

In these same years, a survey of 140 villages and 20 small cities in five regions stretching across the nation showed that the diet of relatively few families met the specifications of recommended allowances (8). Large percentages of the diets were rated as poor and fair. An appalling proportion of families was receiving what might with considerable understatement be called unsatisfactory diets. In the poorest diets of village families, calcium, iron and vitamins A and C were almost never present in more than meager quantities. The collected data indicated that fewer than one-fifth of the families in this country had food supplies in 1936 that met the National Research Council's recommendations with respect to calcium, thiamin, ascorbic acid, riboflavin, vitamin A, protein and iron.

Inadequacy in the consumption of fruits and vegetables was found to be common among 538 farm and 299 village families of Vermont visited in 1936 (9). Low intake of protein occurred in families with children. Of 100 sub-metropolitan urban families in Central and Western Pennsylvania surveyed in 1935-37, it was found (10) that a

high percentage of the families subsisted on diets containing less o the seven essentials than recommended by the Council. Inquiry int the diets of pupils in Wilkes-Barre, Pennsylvania in 1937 showe (11) that very high percentages of 748 white children were receivin amounts of eight essentials below the Council's suggested levels.

Surveys Conducted From 1938-1940:

In a survey in 1938 of families on relief in Washington, D. C. the average daily caloric intake of 87 percent of the white familie was less than 2,800 calories per consumption unit, a standard little, if any, in excess of actual needs (13). The diets of both white and colored families were extremely low in calcium and only slightly better in iron. Diets as low as these in energy value certainly were deficient in most nutrients.

Diet records of 139 elementary school children in a Maine village (1938-39) showed that only one child in seven attained the minimum standard of one good vitamin C food daily (14). In the autumn only 17 of 76 of the children ate any citrus fruit during the week of the record.

Of 3,432 women college students in six institutions in the North Central States (15) canvassed during 1936-40, the following percentages had dietaries containing less than seven servings a week of the respective essential types of foods; whole grain products, 66; citrus fruits, 57; green and yellow vegetables, 40; milk, 29; and meat, 14.

Among 19 rural families in Lancaster County, Pennsylvania, in 1938-40, from high to moderate percentages of 42 white children, 20 white adolescents and 38 white adults, were consuming less than the recommended amounts of eight dietary essentials (16).

In a survey during 1939-40 of over 2,000 high school pupils of low-income families in New York City, high percentages had daily caloric intake below calculated energy needs and less than the Council's recommended daily allowances for seven essentials. Many of the diets were regarded as being below safe levels (17). In contrast, among 293 private school pupils from high-income families (18) it was found that the percentage of pupils receiving substandard amounts of essentials was less – in most instances, much less – than in the preceding group from low-income families. But even among this high-income group, an appreciable percentage failed to get adequate diets.

A survey of dietary records of 1,082 Farm Security Administration families in Louisiana (19) during 1939-40 showed that less than 1

percent had diets which could be classified as good, while 52 percent were fair and 47 percent were poor. None of 509 colored families had good diets.

Among 225 private patients (20) in the upper-income levels, surveyed in Philadelphia in 1940, high percentages had diets containing less than the Council's recommended allowances for eight essentials. Many of the patients had less than 50 percent of the recommended levels of the various essentials. Nine physicians had diets as bad as those of the other patients.

Surveys Conducted From 1941-1943:

From January, 1939 to August, 1941, the dietary habits of 7,363 children and adolescents from 3,922 families in Chicago, representing different national and racial groups and a wide distribution of economic and social conditions, were surveyed (21). Diet patterns of 72 percent of the children failed to meet a standard lower than that recommended by the Council. Many of the diets were inferior even to this low standard. Dietary inadequacies were least often in the protein foods and most often in fruits and vegetables. The diets of 73 percent of the white children were below allowances for fruits and vegetables; in the poorest areas, 98 per cent were below this standard.

Analysis of records of 110 rural adults in Chatham County, North Carolina, surveyed in 1940-41, revealed a high prevalence of unsatisfactory diets (22, 23). Almost all persons received less than the recommended daily amounts of the several essentials; many ate less than half those amounts and a considerable proportion obtained less than a quarter.

From a study of white and colored families in a rural community in middle Tennessee in 1941, diet records were obtained on 1,161 persons (24, 25, 26). Of 206 white infants and children, very high percentages were receiving less than the recommended daily amounts of essentials. For 115 colored infants and children the percentages were even higher. The percentages of white infants and children eating less than half the advised daily allowances were high but were much greater for the colored infants and children. With 113 white adolescents, 76 colored adolescents, 457 white adults and 194 colored adults, the diets in high percentages showed similar serious deficiencies.

Among children of Newport, Maine, in 1940 and 59 University of Maine freshman girls in 1941, the percentages eating the respective

essential kinds of foods in amounts below the standards for a good diet (27, 28) were very high for the children and moderately high for the freshman girls.

A dietary survey of 1,169 school children in Worcester County, Maryland (29), in 1941 revealed that high percentages were not receiving satisfactory amounts of vegetables, fruit, cereal or whole grain, and only 8 percent had a diet adequate in all five factors studied. In a study of 780 families of Home Demonstration Club members in twenty-seven parishes of Louisiana (30) in 1942, 41 percent had diets scored good; 51 percent, fair; 8 percent, poor.

The eating habits of 6,708 grade and high school children in Louisiana (31) in 1942 were evaluated by the dietary pattern recommended by the Council. Only 11 percent of the white and 3 percent of the negro children received a diet adequate in all essentials. The diets were fair among 60 percent of the white and 35 percent of the Negro students; poor, definitely deficient in one or more essential nutrients, among 29 percent of the white and 62 percent of the Negro children.

From a survey of 315 colored families in the Harlem district of New York City (32) in 1942 were reported the following percentages on ratings for food habits: excellent, 8; good, 19; fair, 34; and poor, 39. At least 73 percent of the families had unsatisfactory diets.

In 1941-42 the diets of 1,080 workers in the Lockheed Aircraft Corporation at Burbank, California, were analyzed for their content of both protective foods and essential nutrients (33). Twenty-three percent had no citrus fruit during a week. Only 7 percent ate a whole grain cereal every day; slightly over 50 percent used no whole grain breakfast cereal in a week. Only 11 percent ate regularly vegetables containing vitamin A. Sixty-three percent reported an average daily consumption of milk less than the accepted standard; 37 percent had an average of less than one-half the recommended amount; 11 percent did not drink milk.

The findings made it evident that a large proportion of the diets were unsatisfactory in vitamin A, ascorbic acid, riboflavin and calcium. Only 2 percent had diets which approximated the recommended dietary pattern; 87 percent had unsatisfactory diets in one or more food types. Of the men, 83 percent needed some improvement in their diets. Thirty percent of all diets had less than the two-thirds of the allowance for only one nutrient.

In a Philadelphia survey in 1941-42, from 42 to 97 percent of 562 white children had diets containing less than the advocated levels for nine essentials (34). A similar situation obtained with 56 white persons in Wayne County, North Carolina, in 1942 (23). Most individuals had less than the approved daily quantities of seven essentials; a considerable proportion received less than half the advocated daily amounts.

A nationwide canvass of selected samplings of the population in each of the 48 states showed that the following percentages of persons (35) consumed no protective foods during the day of the canvass: citrus fruits, tomatoes or salad greens, 45; dairy products, 34; leafy and yellow vegetables, 25; other vegetables or fruit, 8; meat, fish or poultry, 12; whole grain or enriched products, 3.

Choice of Dietary Standards:

Some experts object to rating as deficient those diets that were below the Council's recommended allowances, which presumably represent optimum nutrition with a margin of safety (1). They hold that perhaps many persons not having this margin of safety are in no way deficient. However, considering the proportion of families whose diets met only 75, 50 and 25 percent of the recommended levels, it will be found that the percentages of diets failing to meet these lower levels, while slightly less than those falling short of full allowances, are still very considerable.

Limitations of Dietary Surveys:

In appraising surveys, and interpreting findings, the existence of definite uncertainties must be recognized. Under the practical circumstances attending survey work, information solicited for dietary records and the calculated nutritional values of diets are both subject to unavoidable errors. There are unpredictable nutritional losses in foods before consumption, which allow for discrepancies between estimated nutritional values of diets and the amounts of nutrients actually consumed. Any standard diet and system adopted for assessing dietaries are both arbitrary and without absolute significance; consequently they are subject to differences of expert opinion in rating nutritional levels. Gaps exist in present knowledge of the actual nutrient needs of persons of varied activities, of different ages, in pregnancy and lactation, and with conditioned requirements above normal.

The nutrient content of specific foods naturally varies. From the time of harvest to the time of actual consumption, foods are subject to many nutritional impairments and losses. Fruits and vegetables, stored under adverse conditions, may deteriorate in vitamins; some nutritional losses may occur in processing, or through exposure to heat, light and oxidation. Faulty food preparation, including protracted heating, discarding of valuable trimmings and cooking liquids, and reheating of leftovers, also contributes to nutritional impairment of foods.

The very nature of the task of ascertaining the extent of malnutrition suggests many difficulties. Our population is heterogeneous with a wide spread of incomes. Their diets cannot be simply described or accurately ascertained. The types and amounts of food consumed differ from place to place, season to season, family to family and even among family members. These considerations moved Stiebeling in a recent review (36) of studies of American diets to state that knowledge is still too incomplete to make possible a thoroughgoing appraisal of the nutritive adequacy of American diets.

Conclusion:

All of the evidence gleaned from dietary surveys during the last ten years, and covering persons of all ages in many widely separated localities, is in complete agreement that dietary inadequacy, as judged by comparison with recommended standards, is widespread in the nation (1). So consistent, and unanimous, is the evidence that it points to the existence of a possible widespread prevalence of nutritional deficiency states. Considering the limitations of surveys, and that factors other than diet are influential in producing deficiency diseases, it is quite probable that deficiency states are even more prevalent than indicated by the surveys.

Malnutrition creates a problem which is both preventive and corrective. Its preventive aspects seem to require maintenance of ample food production; the more effective distribution of food, which would include further consideration of the judicious enrichment of appropriate foods; and the extension and intensification of diet education at more effective levels. On the corrective side, there is a need for detection and treatment of deficiency states, a need which can best be met by disseminating new diagnostic methods among the medical and public health professions.

PROPERTY OF THE
SEATTLE PUBLIC LIBRARY

REFERENCES CITED

1. Inadequate diets and nutritional deficiencies in the United States. National Research Council Bull. 109 (1943). Washington, D. C.

2. JOLLIFFE, N., J. S. MCLESTER and H. C. SHERMAN. The prevalence of malnutrition. J. Am. Med. Assoc., *118*, 944 (1942).

3. WIEHL, DOROTHY G. Diets of low-income families in New York City. Quart. Bull. Milbank Memorial Fund, *11*, 308 (1933).

4. WIEHL, DOROTHY G. Diets of low-income families surveyed in 1933. Health and depression studies No. 3. Pub. Health Rpts., *51*, 77 (1936).

5. WIEHL, DOROTHY G. Diets of urban families with low incomes. An analysis of weekly food budgets in 472 families in Baltimore, Cleveland, Detroit, Pittsburgh, and Syracuse in April-May 1933. Milbank Memorial Fund Quart., *12*, 343 (1934).

6. STIEBELING, HAZEL K. and ESTHER F. PHIPARD. Diets of families of employed wage earners and clerical workers in cities. U. S. Dept. Agr., Cir. No. 507 (1939).

7. STIEBELING, HAZEL K., DAY MONROE, CALLIE M. COONS, ESTHER F. PHIPARD, and FAITH CLARK. Family food consumption and dietary levels, five regions. Consumer Purchases Study, Farm Series. U. S. Dept. Agr. Misc. Publication No. 405 (1941).

8. STIEBELING, HAZEL K., DAY MONROE, ESTHER F. PHIPARD, SADYE F. ADELSON, and FAITH CLARK. Family food consumption and dietary levels, five regions. Consumer Purchases Study, Urban and Village Series, U. S. Dept. Agr. Misc. Publication No. 452 (1941).

9. BRITTON, VIRGINIA. Food consumption of 538 farm and 299 village families in Vermont. Vermont Agr. Expt. Sta., Bull. No. 474, (1941).

10. SANDERS, AGNES P. and PAULINE B. MACK. Unpublished data.

11. MACK, PAULINE B. and associates. Unpublished data.

12. Recommended dietary allowances. National Research Council Reprint and Cir. Series No. 115, Washington, D. C., (1943).

13. WIEHL, DOROTHY G. and C. E. PALMER. Summer diets of the poor in Washington, D. C. Milbank Memorial Fund Quart., *17*, 5 (1939).

14. MURPHY, ELIZABETH. A study of vitamin C nutrition in a group of school children. II. Dietary evaluation. J. Nutr. *21*, 527 (1941).

15. REYNOLDS, MAY S., MARGARET A. OHLSON, MARTHA S. PITTMAN, HUGHINA MCKAY, MARY BROWN PATTON, EVA DONELSON, RUTH LEVERTON, ELLA J. MEILLER, and MARY H. BITTING. The dietary habits of college students. J. Home Econ., *34*, 379 (1942).

16. SMITH, JANICE M. and associates. Unpublished data.

17. WIEHL, DOROTHY G. Medical evaluation of nutritional status. VII. Diets of high school students of low income families in New York City. Milbank Memorial Fund Quart., *20*, 61 (1942).

18. WIEHL, DOROTHY G. Unpublished data.

19. GRIGSBY, NORA E., LAUREAME C. MCBRYDE, and H. J. DAVIS. A study of the adequacy of diets of Farm Security Administration families in Louisiana. College of Agr., Louisiana State University. Mimeographed Leaflet, (1942).

20. KELLY, H. T. and MYRTLE SHEPPARD. A dietary study of subjects from upper income groups. New England J. of Med., *228*, 118 (1943).

21. HARDY, MARTHA C., ADELAIDE SPOHN, GERTRUDE AUSTIN, SARAH MCGIFFERT, EDNA MOHR, and AGNES B. PETERSON. Nutritional and dietary inadequacies among city children from different socio-economic groups. J. Am. Diet. Assoc., *19*, 173 (1943).

22. MILAM, D. F. A nutrition survey of a small North Carolina Community. Am. J. Pub. Health, *32*, 406 (1942).

23. MILAM, D. F. Unpublished data.

24. YOUMANS, JOHN B., E. WHITE PATTON, and RUTH KERN. Surveys of the nutrition of populations. Am. J. Pub. Health, *32*, 1371 (1942).

25. YOUMANS, JOHN B., E. WHITE PATTON, and RUTH KERN. Surveys of the nutrition of populations. Am. J. Pub. Health, *33*, 58 (1943).

26. YOUMANS, JOHN B., E. WHITE PATTON, RUTH KERN, W. R. SUTTON and RUTH STEINKAMP. Unpublished data.

27. CLAYTON, MARY M. A study of the food habits and nutritional status of children in selected communities in Maine. Maine Agr. Expt. Sta. Bull. No. *405*, 431 (1941).

28. CLAYTON, MARY M. The nutritional status of University of Maine freshman girls as related to their diets. Maine Agr. Expt. Sta. Bull. No. *405*, 437 (1941).

29. WILLARD, W. R. Working for better nutrition in a rural community. Am. J. Pub. Health, *32*, 996 (1942).

30. BRYSON, BERTHA E., CLARA TUCKER and H. J. DAVIS. A study of the diets of Home Demonstration Club Members' families in twenty-seven parishes of Louisiana. Bull. No. 356, Louisiana State Univ. Agr. Expt. Sta., (1942).

31. COCO, LUCILLE D., MARGARET MOORE, GRACE A. GOLDSMITH, G. P. LUCAS, and H. J. DAVIS. A study of the adequacy of diets consumed by grade-school and high-school students in Louisiana. Bull. No. 360, Louisiana State Univ. Agr. Expt. Sta., (1943).

32. DOWNES, JEAN. A study of food habits of tuberculous families in a Harlem area of New York City. Milbank Memorial Fund Quart. *21*, 164 (1943).

33. WIEHL, DOROTHY G. Diets of a group of aircraft workers in Southern California. Milbank Memorial Fund Quart. *20*, 329 (1942).

34. MACK, PAULINE B., CHARLES URBACH, JANICE M. SMITH, CATHERINE H. LOGAN, ELIZABETH K. ROSE, A. H. STEWART, and PAUL DODDS. A contribution to the study of nutritional status in rural and urban populations. Penn. State College Bull. 36 (1942).

35. GALLUP, GEORGE. Report from American Institute of Public Opinion. *New York Times* (Feb. 8, 1943).

36. STIEBELING, H. K. Adequacy of American diets. J. Am. Med. Assoc. *121*, 831 (1943).

NEWS DIGEST

CALORIC INTAKE OF STUDENTS—Recent surveys conducted as part of a medical evaluation of the nutritional status of various age, sex and economic groups in New York City have yielded interesting information concerning the caloric intake of high school students. Examination of the caloric content of the students' diets revealed that variation in caloric need among them is so great that no average requirement can be considered reliable for evaluating the adequacy of an individual's caloric intake. It was found, however, that students in the high-income group received, on the average, the energy value needed, but those in the low-income group, particularly boys, had an average caloric intake below their estimated requirement. Estimates of energy requirements based on detailed histories suggest that most urban high school students do not need as many calories as have been recommended. *Milbank Memorial Fund Quarterly* 22, 5 (1944); abstr. in *J. Am. Diet. Assoc.* 20, 178 (1944).

EVALUATION OF FOOD PROTEINS—Elucidation of the essential amino acids by Rose has opened the possibility of evaluating the nutritional status of protein foods from a knowledge of their content of the essential amino acids. Analysis of the proteins of selected food groups for twelve amino acids permitted the tentative nutritional evaluation of the proteins, an approximation of the average daily per capita consumption of these amino acids and the contribution made by each of the specific groups. The analyses confirm the high nutritive value of the animal proteins, reveal the potentialities and weaknesses of the plant proteins, and, when specific deficiencies are noted, indicate the mode of correction of those deficiencies. The results indicate a slight superiority of egg proteins over meat, fish and dairy products and allow a tentative classification of plant proteins in ascending order of nutritive value: (1) corn grits, (2) whole corn, (3) white flour, (4) whole wheat flour, rice, (5) oat meal, (6) soy flour, wheat and corn germs, yeast. Knowledge of the essential amino acids content of these products makes it possible to supplement one with another to improve their biological protein values. *Amer. Chem. Soc. Meeting, Cleveland,* April 3-7, 1944.

JAPANESE INTERNMENT CAMPS—Diets supplied to civilians in internment camps in China vary from 1,400 to 1,900 calories per day. Since internees carry out all the work of the camp, this leads to general loss of weight. One of the dietary factors most seriously lacking is calcium. This is met in part by saving of egg shells, washing and powdering them, and feeding them to the adolescent internees. *Amer. Chem. Soc. Meeting, Cleveland,* Apr. 3-7, 1944.

MOLASSES YEAST—The selection of raw materials and their purification before use markedly influence the quantity and quality of the molasses distillers' dried yeast produced. A process now in successful operation produces simultaneously from molasses a high percentage of alcohol and large quantities of yeast. Feeding experiments show molasses yeast to be nutritionally as good as brewer's yeast. The production of high grade molasses yeast promises a new source of income in postwar time for molasses distilleries. *Amer. Chem. Soc. Meeting,* Cleveland, Apr. 3-7, 1944.

VITAMIN C LOSSES — In cooking vegetables, the preparation of the vegetable is the important factor in determining the effect of the quantity of cooking water on the retention of ascorbic acid. Snap beans, cabbage and potatoes were cooked in a large volume of water in a covered utensil and compared for ascorbic acid content with those cooked in a small amount of water in a tightly covered utensil. In the case of potatoes, which were cooked whole or in large pieces, and beans, the volume of water used in cooking caused no significant difference in ascorbic acid losses. The cabbage cut into pieces one-half to three-quarters of an inch thick showed a loss increasing from 16 percent when cooked in a small amount of water to 46 percent for a large quantity of water. Cabbage cooked in the smallest possible amount of water contained more than one-third of an adult man's requirement. One serving of snap beans or potatoes, cooked by either method, would furnish only from 5 to 10 percent of the daily requirement. *J. Home Econ., 36,* 160 (1944).

NUTRITION IN HOLLAND—Food supplies in the conquered Netherlands are definitely insufficient with the official daily ration at the end of 1943 providing only 1,417 calories. In addition, the diet is deficient in vitamins. The lack of whole milk, butter and fresh vegetables has reduced the intake of vitamin A. Rickets, practically unknown before the war, prevails because of shortages of vitamin D rich foods. An insufficiency of vitamin B_2 has caused widespread intestinal disorders. The winter diet contained too litt ascorbic acid, but has not resulted i genuine vitamin C deficiency disease. A shortage of B_1 has been avoided however, because brown bread and po tatoes are in sufficient quantities in th official ration. *Aneta—Official Nether lands and Netherlands Indies News Agency,* London, Mar. 22, 1944.

VITAMIN C REQUIREMENTS— Interesting data on the vitamin C re quirements of school age girls have been obtained from experiments con ducted with a group of 30 girls rang ing from six to twelve years in age. The girls were divided into six groups on the basis of original ascorbic acid levels of the blood, age, height, weight and deviation from average weight. During three 7-day periods the children received daily supplements of crystalline ascorbic acid ranging from 10 mg. for the first group to 60 mg. for the sixth. The average weekly vitamin C intake from foods was about 22 mg., resulting in total intakes ranging from 32 to 82 mg. ascorbic acid. The blood concentration and the response to a test dose were the criteria for judging the state of saturation. It was found that none of the children on intakes of 32 or 42 mg. of ascorbic acid, and only one on an intake of 52 mg., was receiving sufficient vitamin C to maintain satisfactory standards. Four-fifths of those receiving 62 mg. and all who received 72 mg. were saturated. On the basis of this study, 62 to 72 mg. of ascorbic acid is suggested as an adequate allowance for pre-adolescent girls of 6 to 12 years. *J. Nutr. 26,* 539 (1943).